Fig. 3A

Mouse alpha1-anitrypsin mRNA and polypeptide sequence

```
Met Thr Pro Ser Ile Ser Trp Gly Leu Leu Leu Leu Ala Gly Leu Cys Cys Leu Val Pro
ATG ACT CCC TCC ATC TCA TGG GGT CTA CTG CTT CTG GCA GGC CTG TGT TGC CTG GTC CCC
TAC TGA GGG AGG TAG AGT ACC CCA GAT GAC GAA GAC CGT CCG GAC ACA ACG GAC CAG GGG

Ser Phe Leu Ala Glu Asp Val Gln Glu Thr Asp Thr Ser Gln Lys Asp Gln Ser Pro Ala
AGC TTT CTG GCT GAG GAT GTT CAG GAG ACA GAC ACC TCC CAG AAG GAT CAG TCC CCA GCC
TCG AAA GAC CGA CTC CTA CAA GTC CTC TGT CTG TGG AGG GTC TTC CTA GTC AGG GGT CGG

Ser His Glu Ile Ala Thr Asn Leu Gly Asp Phe Ala Ile Ser Leu Tyr Arg Glu Leu Val
TCC CAT GAG ATC GCT ACA AAC CTG GGA GAC TTT GCA ATC AGC CTA TAC CGG GAG CTG GTC
AGG GTA CTC TAG CGA TGT TTG GAC CCT CTG AAA CGT TAG TCG GAT ATG GCC CTC GAC CAG

His Gln Ser Asn Thr Ser Asn Ile Phe Phe Ser Pro Val Ser Ile Ala Thr Ala Phe Ala
CAT CAG TCC AAC ACT TCC AAC ATC TTC TTC TCC CCA GTG AGC ATT GCC ACA GCC TTT GCT
GTA GTC AGG TTG TGA AGG TTG TAG AAG AAG AGG GGT CAC TCG TAA CGG TGT CGG AAA CGA

Met Leu Ser Leu Gly Ser Lys Gly Asp Thr His Thr Gln Ile Leu Glu Gly Leu Gln Phe
ATG CTC TCC CTA GGG AGC AAG GGT GAC ACT CAC ACG CAG ATC CTA GAG GGC CTG CAG TTC

TAC GAG AGG GAT CCC TCG TTC CCA CTG TGA GTG TGC GTC TAG GAT CTC CCG GAC GTC AAG
Asn Leu Thr Gln Thr Ser Glu Ala Asp Ile His Lys Ser Phe Gln His Leu Leu Gln Thr

AAC CTC ACA CAA ACA TCG GAG GCT GAC ATC CAC AAG TCC TTC CAA CAC CTC CTC CAA ACC
TTG GAG TGT GTT TGT AGC CTC CGA CTG TAG GTG TTC AGG AAG GTT GTG GAG GAG GTT TGG

Leu Asn Arg Pro Asp Ser Glu Leu Gln Leu Ser Thr Gly Asn Gly Leu Phe Val Asn Asn
CTC AAC AGA CCA GAC AGT GAG CTG CAG TTG AGC ACA GGC AAT GGC CTC TTT GTC AAC AAT
GAG TTG TCT GGT CTG TCA CTC GAC GTC AAC TCG TGT CCG TTA CCG GAG AAA CAG TTG TTA

Asp Leu Lys Leu Val Glu Lys Phe Leu Glu Glu Ala Lys Asn His Tyr Gln Ala Glu Val
GAC CTG AAG CTG GTG GAG AAG TTT CTG GAA GAG GCC AAG AAC CAT TAT CAG GCA GAA GTC
CTG GAC TTC GAC CAC CTC TTC AAA GAC CTT CTC CGG TTC TTG GTA ATA GTC CGT CTT CAG

Phe Ser Val Asn Phe Ala Glu Ser Glu Glu Ala Lys Lys Val Ile Asn Asp Phe Val Glu
TTC TCT GTC AAC TTT GCA GAG TCA GAG GAG GCC AAG AAA GTG ATT AAT GAT TTT GTG GAG
AAG AGA CAG TTG AAA CGT CTC AGT CTC CTC CGG TTC TTT CAC TAA TTA CTA AAA CAC CTC

Lys Gly Thr Gln Gly Lys Ile Val Glu Ala Val Lys Glu Leu Asp Gln Asp Thr Val Phe
AAG GGA ACC CAA GGA AAG ATA GTT GAG GCA GTG AAA GAA CTG GAC CAA GAC ACA GTT TTC
TTC CCT TGG GTT CCT TTC TAT CAA CTC CGT CAC TTT CTT GAC CTG GTT CTG TGT CAA AAG

Ala Leu Gly Asn Tyr Ile Leu Phe Lys Gly Lys Trp Lys Lys Pro Phe Asp Pro Glu Asn
GCC CTG GGC AAT TAC ATT CTT TTT AAA GGC AAA TGG AAG AAG CCA TTC GAT CCT GAG AAC
CGG GAC CCG TTA ATG TAA GAA AAA TTT CCG TTT ACC TTC TTC GGT AAG CTA GGA CTC TTG

Thr Glu Glu Ala Glu Phe His Val Asp Lys Ser Thr Thr Val Lys Val Pro Met Met Thr
ACT GAA GAA GCT GAG TTC CAC GTG GAC AAG TCC ACC ACG GTG AAG GTG CCC ATG ATG ACC
TGA CTT CTT CGA CTC AAG GTG CAC CTG TTC AGG TGG TGC CAC TTC CAC GGG TAC TAC TGG

Leu Ser Gly Met Leu Asp Val His His Cys Ser Thr Leu Ser Ser Trp Val Leu Leu Met
CTC TCG GGC ATG CTT GAT GTG CAC CAT TGC AGC ACA CTC TCC AGC TGG GTG CTG CTG ATG
GAG AGC CCG TAC GAA CTA CAC GTG GTA ACG TCG TGT GAG AGG TCG ACC CAC GAC GAC TAC

Asp Tyr Ala Gly Asn Ala Ser Ala Val Phe Leu Leu Pro Glu Asp Gly Lys Met Gln His
GAT TAC GCG GGC AAC GCC AGT GCT GTC TTC CTC CTG CCC GAA GAT GGG AAG ATG CAG CAT
CTA ATG CGC CCG TTG CGG TCA CGA CAG AAG GAG GAC GGG CTT CTA CCC TTC TAC GTC GTA

Leu Glu Gln Thr Leu Asn Lys Glu Leu Ile Ser Lys Ile Leu Leu Asn Arg Arg Arg Arg
CTG GAG CAA ACT CTC AAC AAG GAG CTC ATC TCT AAG ATC CTG CTA AAC AGG CGC AGA AGG
GAC CTC GTT TGA GAG TTG TTC CTC GAG TAG AGA TTC TAG GAC GAT TTG TCC GCG TCT TCC

Leu Val Gln Ile His Ile Pro Arg Leu Ser Ile Ser Gly Glu Tyr Asn Leu Lys Thr Leu
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TTA GTC CAG ATC CAT ATC CCC AGA CTG TCC ATC TCT GGA GAA TAT AAC TTG AAG ACA CTC
AAT CAG GTC TAG GTA TAG GGG TCT GAC AGG TAG AGA CCT CTT ATA TTG AAC TTC TGT GAG

Met Ser Pro Leu Gly Ile Thr Arg Ile Phe Asn Asn Gly Ala Asp Leu Ser Gly Ile Thr
ATG AGT CCA CTG GGC ATC ACC CGG ATC TTC AAC AAT GGG GCT GAC CTC TCC GGA ATC ACA
TAC TCA GGT GAC CCG TAG TGG GCC TAG AAG TTG TTA CCC CGA CTG GAG AGG CCT TAG TGT

Glu Glu Asn Ala Pro Leu Lys Leu Ser Lys Ala Val His Lys Ala Val Leu Thr Ile Asp
GAG GAG AAT GCT CCC CTG AAG CTC AGC AAG GCT GTG CAT AAG GCT GTG CTG ACC ATC GAT
CTC CTC TTA CGA GGG GAC TTC GAG TCG TTC CGA CAC GTA TTC CGA CAC GAC TGG TAG CTA

Glu Thr Gly Thr Glu Ala Ala Ala Ala Thr Val Phe Glu Ala Val Pro Met Ser Met Pro
GAG ACA GGA ACA GAA GCT GCA GCA GCT ACA GTC TTT GAA GCC GTT CCT ATG TCT ATG CCC
CTC TGT CCT TGT CTT CGA CGT CGT CGA TGT CAG AAA CTT CGG CAA GGA TAC AGA TAC GGG

Pro Ile Leu Arg Phe Asp His Pro Phe Leu Phe Ile Ile Phe Glu Glu His Thr Gln Ser
CCT ATC CTG CGC TTC GAC CAC CCT TTC CTT TTT ATA ATA TTT GAA GAA CAC ACT CAG AGC
GGA TAG GAC GCG AAG CTG GTG GGA AAG GAA AAA TAT TAT AAA CTT CTT GTG TGA GTC TCG

Pro Ile Phe Val Gly Lys Val Val Asp Pro Thr His Lys ***
CCC ATC TTT GTG GGA AAA GTG GTA GAT CCC ACA CAT AAA TGA
GGG TAG AAA CAC CCT TTT CAC CAT CTA GGG TGT GTA TTT ACT
```
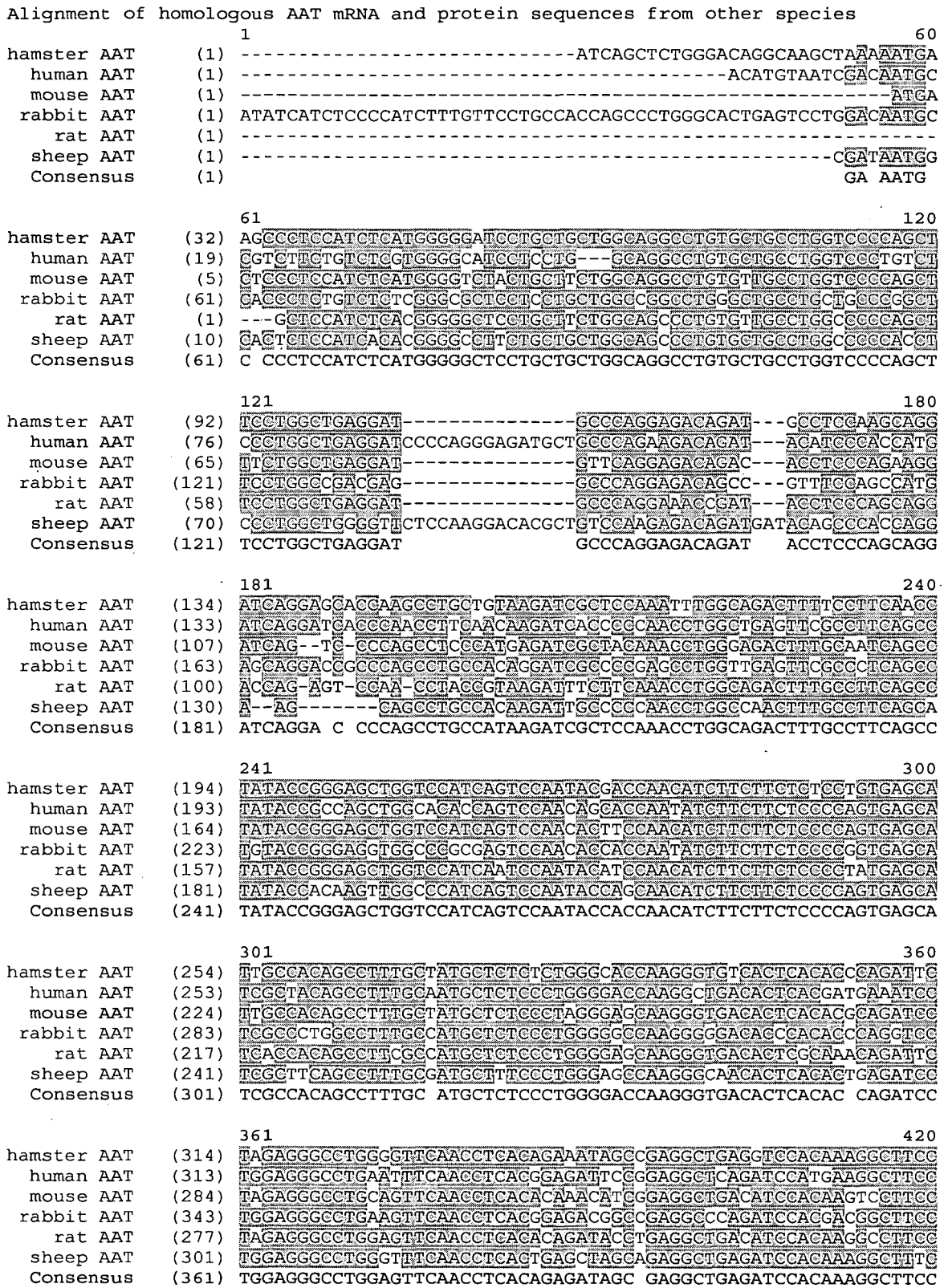

Figure 3B

Mouse EMAP mRNA and polypeptide sequence

```
Met Pro Thr Glu Thr Glu Arg Cys Ile Glu Ser Leu Ile Ala Val Phe Gln Lys Tyr Ser
ATG CCT ACA GAG ACT GAG AGA TGC ATT GAG TCC CTG ATT GCT GTT TTC CAA AAG TAC AGC
TAC GGA TGT CTC TGA CTC TCT ACG TAA CTC AGG GAC TAA CGA CAA AAG GTT TTC ATG TCG

Gly Lys Asp Gly Asn Asn Thr Gln Leu Ser Lys Thr Glu Phe Leu Ser Phe Met Asn Thr
GGG AAG GAT GGA AAC AAC ACT CAA CTC TCC AAA ACT GAA TTC CTT TCC TTC ATG AAC ACA
CCC TTC CTA CCT TTG TTG TGA GTT GAG AGG TTT TGA CTT AAG GAA AGG AAG TAC TTG TGT

Glu Leu Ala Ala Phe Thr Lys Asn Gln Lys Asp Pro Gly Val Leu Asp Arg Met Met Lys
GAG CTG GCT GCC TTC ACA AAG AAC CAG AAG GAT CCT GGT GTC CTT GAC CGC ATG ATG AAG
CTC GAC CGA CGG AAG TGT TTC TTG GTC TTC CTA GGA CCA CAG GAA CTG GCG TAC TAC TTC

Lys Leu Asp Leu Asn Cys Asp Gly Gln Leu Asp Phe Gln Glu Phe Leu Asn Leu Ile Gly
AAG CTG GAC CTC AAC TGT GAC GGG CAG CTA GAT TTC CAA GAG TTT CTC AAC CTC ATT GGT
TTC GAC CTG GAG TTG ACA CTG CCC GTC GAT CTA AAG GTT CTC AAA GAG TTG GAG TAA CCA

Gly Leu Ala Ile Ala Cys His Asp Ser Phe Ile Gln Thr Ser Gln Lys Arg Ile ***
GGC TTA GCT ATA GCG TGC CAT GAT TCT TTC ATC CAA ACT TCC CAG AAG CGA ATC TAA
CCG AAT CGA TAT CGC ACG GTA CTA AGA AAG TAG GTT TGA AGG GTC TTC GCT TAG ATT
```

Figure 3C


Alignment of homologous AAT mRNA and protein sequences from other species
hamster AAT
human AAT
mouse AAT
rabbit AAT
rat AAT
sheep AAT
Consensus

```
                      421                                                 480
hamster AAT    (374)  ATAACCTCCTCCAGACCTTCAACAGGCCAGACAATGAGCTTCAGCTGACCACAGGCAATG
  human AAT    (373)  AGGAACTCCTCCGTACCCTAAACCAGCCAGACAGCCAGCTCCAGCTGACCACCGGCAATG
  mouse AAT    (344)  AACACCTCCTCCAAAGCCTCAACAGACCAGACAGTGAGCTGCAGTTGAGCACAGGCAATG
 rabbit AAT    (403)  GGCACCTCCTGCACACCGTCAACAGGCCCGACAGCGAGCTGCAGCTGGCCGCCGGCAACG
    rat AAT    (337)  ATCACCTCCTCCAAACTCTCAACAGGCCAGACAGTGAGCTGCAGCTGAACACAGGCAATG
  sheep AAT    (361)  AGCATCTTCTCCACACCCTCAACCAGCCAAACCACCAGCTGCAACTGACCACCGGCAATG
  Consensus    (421)  AGCACCTCCTCCA ACCCTCAACAGGCCAGACAGTGAGCTGCAGCTGACCACCGGCAATG

                      481                                                 540
hamster AAT    (434)  GCCTGTTCATCCACAACAATCTAAAGCTGGTGGATAAGTTCCTGGAAGAGGTCAAGAACG
  human AAT    (433)  GCCTGTTCCTCAGCGAGGGCCTGAAGCTAGTGGATAAGTTTTTGGAGGATGTTAAAAAGT
  mouse AAT    (404)  GCCTCTTTGTCAACAATGACCTGAAGCTGGTGGAGAAGTTTCTGGAAGAGGCCAAGAACC
 rabbit AAT    (463)  CCCTGGTCGTCAGCGAGAACCTGAAGCTGCAGCACAAGTTTCTAGAAGACGCCAAGAACC
    rat AAT    (397)  GCCTCTTTGTCAACAAGAATCTGAAGCTGGTGGAGAAGTTTCTGGAAGAGGTCAAGAACA
  sheep AAT    (421)  GTCTGTTCATCAATGAGAGTGCAAAGCTAGTTGATACGTTTTTGGAGGATGTCAAGAATC
  Consensus    (481)  GCCTGTTCGTCAACGAGAATCTGAAGCTGGTGGATAAGTTTCTGGAAGAGGTCAAGAACC

                      541                                                 600
hamster AAT    (494)  ATTACCACTCGGAAGCCTTCTCTGTCAACTTCACAGACTCAGAAGAGGCCAAGAAAGTGA
  human AAT    (493)  TGTAGCACTCAGAAGCCTTCACTGTCAACTTCGGGGATCACGAAGAGGCCAAGAAACAGA
  mouse AAT    (464)  ATTATCAGGCAGAAGTCTTCTCTGTCAACTTTGCAGAGTCAGAGGAGGCCAAGAAAGTGA
 rabbit AAT    (523)  TGTACCAGTCCGAAGCCTTCCTCGTCGACTTCAGGGAGCCCGAGCAGGCCAAGACCAAGA
    rat AAT    (457)  ATTACCACTCAGAAGCCTTCTCTGTCAACTTTGCCGACTCAGAAGAGGCTAAGAAAGTAA
  sheep AAT    (481)  TGCATCACTGCAAAGCCTTCTCCATCAACTTCAGGGATGCTGAGGAGGCCAAGAAGAAGA
  Consensus    (541)  TTTACCACTCAGAAGCCTTCTCTGTCAACTTCGGGGACTCAGAGGAGGCCAAGAAAGTGA

                      601                                                 660
hamster AAT    (554)  TCAACGGTTTTGTGGAGAAGGGAACCCAAGGAAAGATAGTTGATTTAGTGAAGGACCTTG
  human AAT    (553)  TCAACGATTACGTGGAGAAGGGTACTCAAGGGAAAATTGTGGATTTGGTCAAGGAGCTTG
  mouse AAT    (524)  TTAATGATTTTGTGGAGAAGGGAACCCAAGGAAAGATAGTTGAGGCAGTGAAAGAACTGG
 rabbit AAT    (583)  TCAACAGCCACGTGGAGAAGGGGACCCGAGGGAAGATCGTGGACTTGGTGCAAGAGCTGG
    rat AAT    (517)  TTAATGATTATGTAGAGAAGGGAACCCAAGGAAAGATAGTTGATTTGATGAAACAGCTGG
  sheep AAT    (541)  TCAATGATTATGTAGAGAAGGGAAGCCATGGAAAAATTGTGGATTTGGTAAAGGATCTTG
  Consensus    (601)  TCAATGATTATGTGGAGAAGGGAACCCAAGGAAAGATAGTTGATTTGGTGAAGGAGCTTG

                      661                                                 720
hamster AAT    (614)  ACAAAGACACAGTTCTTGCCCTGGTGAATTACATTTTCTTTAAAGGCAAGTGGAAGAAGC
  human AAT    (613)  ACAGAGACACAGTTTTTGCTCTGGTGAATTACATCTTCTTTAAAGGCAAATGGGAGAGAC
  mouse AAT    (584)  ACCAAGACACAGTTTTCGCCCTGGGCAATTACATTCTTTTAAAGGCAAATGGAAGAAGC
 rabbit AAT    (643)  ACGCCCGCACACTGCTTGCCCTGGTGAACTACGTTTTCTTCAAAGGGAAGTGGGAGAAGC
    rat AAT    (577)  ACGAAGACACGGTTTTTGCCCTGGTGAATTACATTTTCTTTAAAGGCAAGTGGAAGAGGC
  sheep AAT    (601)  ACCAAGACACAGTTTTTGCTCTGGTCAATTACATATCCTTTAAAGGAAAATGGGAGAAGC
  Consensus    (661)  AC AAGACACAGTTTTTGCCCTGGTGAATTACATTTTCTTTAAAGGCAAGTGGGAGAAGC

                      721                                                 780
hamster AAT    (674)  CCTTCGATGCAGACAACACTGAGGAAGCTGACTTCCACGTGGACAAGACCACCACGGTGA
  human AAT    (673)  CTTTTGAAGTCAAGGACACCGAGGACGAGGACTTCCACGTGGACCAGGTGACCACCGTGA
  mouse AAT    (644)  CATTCGATCCTGAGAACACTGAAGAAGCTGAGTTCCACGTGGACAAGTCCACCACGGTGA
 rabbit AAT    (703)  CCTTCGAGCCCGAGAACACCAAGGAAGAGGACTTCCACGTGGACGCCACGACCACGGTGC
    rat AAT    (637)  CATTCAATCCTGAGCACACTAGGGATGCTGACTTTCACGTAGACAAGTCCACCACAGTGA
  sheep AAT    (661)  CCTTCGAGGTCGAGCACACCACGGAGAGGGACTTCCACGTGAATGAGCAAACCACCGTGA
  Consensus    (721)  CCTTCGATGCCGAGAACACTGAGGAAGCTGACTTCCACGTGGACAAG CCACCACGGTGA

                      781                                                 840
hamster AAT    (734)  AGGTGCCCATGATGAGCCGCCTGGGCATGTTTGACGTGCACTATGTTAGCACTCTGTCCA
  human AAT    (733)  AGGTCCCTATGATGAAGCGTTTAGGCATGTTTAACATCCAGCACTGTAAGAAGCTGTCCA
  mouse AAT    (704)  AGGTGCCCATGATGACCCTCTCGGGCATGCTTGATGTGCACCATTGCAGCACACTCTCCA
 rabbit AAT    (763)  GGGTGCCCATGATGTCGCGCCTGGGCATGTATGTGATGTTCCACTGTAGCACGCTGGCCA
    rat AAT    (697)  AGGTGCCCATGATGAACGGCCTGGGCATGTTTGACATGCACTATTGCAGCACACTGTCCA
  sheep AAT    (721)  AGGTGCCCATGATGAACCGCCTGGGCATGTTTGACCTCCACTACTGTGACAAGCTCGCCA
  Consensus    (781)  AGGTGCCCATGATGAACCGCCTGGGCATGTTTGACATGCACTATTGTAGCACGCTGTCCA
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                        841                                                 900
hamster AAT    (794) GCTGGGTGCTGCTGATGGATTACCTGGGCAACGCCACTGCCATCTTCATCCTACCTGATG
  human AAT    (793) GCTGGGTACTGCTAATGAAATACCTGGGCAATGCCACCGCCATCTTCTTCCTACCTGATG
  mouse AAT    (764) GCTGGGTGCTGCTGATGGATTACGCGGGCAACGCCAGTGCTGTCTTCCTCCTGCCCGAAG
 rabbit AAT    (823) GCACGGTCGTGCTGATGGACTACAAGGGCAACGCCACGGCCCTCTTCCTCCTGCCCGACG
    rat AAT    (757) GCTGGGTGCTGATGATGGATTACCTGGGCAACGCCACTGCCATCTTCCTCCTGCCCGATG
  sheep AAT    (781) GCTGGGTGCTGCTGCTGGACTACGTGGGCAACGTCAGCGCCTGCTTCATCCTGCCCGACC
  Consensus    (841) GCTGGGTGCTGCTGATGGATTACCTGGGCAACGCCACTGCCATCTTCCTCCTGCCCGATG

                        901                                                 960
hamster AAT    (854) ATGGCAAGATGCAGCATCTGGAGCAAACTCTCAACAAGGAAATCATTGGCAAGTTCCTGA
  human AAT    (853) AGGGGAAACTACAGCACCTGGAAAATGAACTCACCCACGATATCATCACCAAGTTCCTGG
  mouse AAT    (824) ATGGGAAGATGCAGCATCTGGAGCAAACTCTCAACAAGGAGCTCATCTCTAAGATCCTGC
 rabbit AAT    (883) AGGGGAAGCTGCAGCACCTGGAGCACACGCTCACCACGGAGCTCATCGCCAAGTTCCTGG
    rat AAT    (817) ATGGCAAGATGCAGCATCTGGAGCAAACTCTCACCAAGGATCTCATTTCCCGGTTCCTGC
  sheep AAT    (841) TCGGGAAACTGCAGCAGCTGGAAGACAAGCTCAACAACGAACTCCTCGCCAAGTTCCTGG
  Consensus    (901) ATGGGAAGCTGCAGCATCTGGAGCAAACTCTCACCAAGGA CTCATCGCCAAGTTCCTGG

                        961                                                1020
hamster AAT    (914) AGGACAGACACACAAGGTCAGCCAATGTACACTTCCCCAAACTGTCCATCTCTGGAACCT
  human AAT    (913) AAAATGAAGACAGAAGGTCTGCCAGCTTACATTTACCCAAACTGTCCATTACTGGAACCT
  mouse AAT    (884) TAAACAGGCGCAGAAGGTTAGTCCAGATCCATATCCCCAGACTGTCCATCTCTGGAGAAT
 rabbit AAT    (943) CAAAAAGCAGCTTCAGGTCTGTCACGGTCCGTTTTCCCAAACTCTCCATTTCTGGAACCT
    rat AAT    (877) TAAACAGGCAAACAAGGTCAGCCATTCTGTACTTCCCCAAACTGTCCATCTCTGGAACCT
  sheep AAT    (901) AAAAGAAATATGCAAGTTCTGCCAATTTACATTTGCCCAAACTGTCCATTTCTGAAACGT
  Consensus    (961) AAAACAGACACACAAGGTCTGCCAAT TCCATTTCCCCAAACTGTCCATTTCTGGAACCT

                        1021                                               1080
hamster AAT    (974) ATAACTTGAAGACAGCCCTGGATCCGCTGGGCATCACCCAGGTCTTCAGCAATGGGGGCCG
  human AAT    (973) ATGATCTGAAGAGCGTCCTGGGTCAACTGGGCATCACTAAGGTCTTCAGCAATGGGGCTG
  mouse AAT    (944) ATAACTTGAAGACACTCATGAGTCCACTGGGCATCACCCGGATCTTCAACAATGGGGCTG
 rabbit AAT   (1003) ACGACCTGAAACCCCTCCTGGGCAAACTGGGCATCACCCAGGTCTTCAGCGACAACGCGG
    rat AAT    (937) ATAACTTGAAGACACTCCTGAGCTCACTGGGCATCACCCGGGTCTTCAACAATGATGCTG
  sheep AAT    (961) ACGATCTGAAAAGTGTCCTGGGTGAACTGGGCATCAAGAGGGTCTTCAGCAACGGGGCTG
  Consensus   (1021) ATGACTTGAAGACAGTCCTGGGTCCACTGGGCATCACCCGGGTCTTCAGCAATGGGGCTG

                        1081                                               1140
hamster AAT   (1034) ACCTTTCTGGGATCACAGAGGA---TGTTCCCCTGAAGCTTGGCAAGGCTGTGCATAAGG
  human AAT    (1033) ACCTCTCCGGGGTCACAGAGGA---GGCACCCCTGAAGCTCTCCAAGGCCGTGCATAAGG
  mouse AAT    (1004) ACCTCTCCGGAATCACAGAGGAGAATGCTCCCCTGAAGCTCAGCAAGGCTGTGCATAAGG
 rabbit AAT    (1063) ACCTCTCGGGGATCACGGAGCA---GGAAGCTCTGAAGGTGTCCCAGGCCCTGCACAAGG
    rat AAT     (997) ATCTCTCTGGAATCACAGAGGA---TGCCCCCCTGAAGCTTAGCCAGGCTGTGCATAAGG
  sheep AAT    (1021) ACCTCTCAGGGATCACCGAGGA---ACAGCCTCTGATGGTGTCCAAGGCGCTCCACAAGG
  Consensus    (1081) ACCTCTC GGGATCACAGAGGA   TGC CCCCTGAAGCT TGCAAGGCTGTGCATAAGG

                        1141                                               1200
hamster AAT    (1091) CTGTGCTGACCATCGATGAGAGAGGGACGGAAGCTGCAGGGGCCACATTTATGGAAATCA
  human AAT    (1090) CTGTGCTGACCATCGACGAGAAGGGGACTGAAGCTGCTGGGGCCATGTTTTTAGAGGCCA
  mouse AAT    (1064) CTGTGCTGACCATCGATGAGACAGGAACAGAAGCTGCAGCAGCTACAGTCTTTGAAGCCG
 rabbit AAT    (1120) TGGTGCTGACCATCGACGAGAGAGGGACCGAAGCTGCCGGGGCCACATTTGTGGAATACG
    rat AAT    (1054) CTGTGCTGACGTTAGATGAGAGGGGAACAGAGGCTGCAGGAGCCACTGTGGTGGAGGCCG
  sheep AAT    (1078) CTGCGCTGACCATTGATGAGAAAGGGACAGAAGCTGCTGGGGCCACGTTTCTGGAAGCTA
  Consensus    (1141) CTGTGCTGACCATCGATGAGAGAGGGACAGAAGCTGCAGGGGCCACATTT TGGAAGCCG

                        1201                                               1260
hamster AAT    (1151) TCCCCATGTCTGTGCCCCCTGAGGTGAACTTTAACAGCCCTTTCATTGCCATAATATATG
  human AAT    (1150) TACCAATGTCTATCCCCCAGAGGTCAAGTTCAACAAACCCTTTGTCTTCTTAATGATTG
  mouse AAT    (1124) TTCCTATGTCTATGCCCCCTATCCTGCGCTTCGACCACCCTTTCCTTTTTATAATATTTG
 rabbit AAT    (1180) TACTGTATTCTATGCCCCAAAGGGTCACCTTTGACAGGCCCTTCCTCTTTGTCATCTACA
    rat AAT    (1114) TCCCCATGTCTCTGCCCCCTCAAGTGAAGTTCGACCACCCTTTCATTTTCATGATAGTTG
  sheep AAT    (1138) TCCCCATGTCCCTTCCCCCAGACGTCGAGTTCAACAGACCCTTCCTCTGCATCCTCTACG
  Consensus    (1201) TCCCCATGTCTATGCCCCCTGAGGTGAAGTTCGACAGCCCTTTCCTTTTCATAATATTTG
```

```
                        1261                                                    1320
hamster AAT    (1211) ATAGACAGACAGCAAAGAGCCCCCTCTTTGTGGGAAAAGTGGTGGATCCCACACGTTAAT
  human AAT    (1210) AACAAAATA---CCAAGTCTCCCCTCTTCATGGGAAAAGTGGTGAATCCCACCCAAAAAT
  mouse AAT    (1184) AAGAACACA---CTCAGAGCCCCATCTTTGTGGGAAAAGTGGTAGATCCCACACATAAAT
 rabbit AAT    (1240) GTCATGAGG---TCAAGAGTCCCCTCTTCGTGGGGAAAGTGGTGGATCCCACCCCAACACT
    rat AAT    (1174) AAT--CAGA-AACTCAGAGCCCCCTCTTTGTGGGAAAAGTGATAGATCCCACACGTTAAT
  sheep AAT    (1198) ACAGAAACA---CCAAGTCTCCCCTCTTCGTGGGAAAGGTGGTGAATCCCACCCAAGCCT
  Consensus    (1261) AA AACAGA   CCAAGAGTCCCCTCTTTGTGGGAAAAGTGGTGGATCCCACCCAT AAT

                        1321                                                    1380
hamster AAT    (1271) CACAAT-TCTCAGTC-AGATGTCATCTTTTCTGGATTGGGTCCCCT-----CCCCAGTGA
  human AAT    (1267) AACTGCCTCTCGCTCCTCAACCGCTCCCCTCCATCCCTGGCCCCCT----CCCTGGATGA
  mouse AAT    (1241) GA----------------------------------------------------------
 rabbit AAT    (1297) AAGACCCCACCGCAGCACATTAAAGCTCTGAGCTGCCCTCCCAGGGGGCAGCCCCTC---
    rat AAT    (1231) CACTGT-CCTCAG---AAGTCACATCCCTTCTGGATCGGGTCCCCT-----TCCTAATAA
  sheep AAT    (1255) AAGTGCCTCTCGGGGTTCAGCTTTCCCCTCCCAGGCCAGGTCCCCTTCTTCCCTCCATGG
  Consensus    (1321) AACTGCCTCTCGG    ACATC CATCCCTTC  G CC GGTCCCCT      CCCC ATGA

                        1381                                               1435
hamster AAT    (1324) CATTAAACACAGGCTGTCCTGGCCCACCCATGCCTGAGTGCTTCTGCAAATGCTC
  human AAT    (1323) CATTAAAGAAGGGTTGAGCTGGA--------------------------------
  mouse AAT    (1243) -------------------------------------------------------
 rabbit AAT    (1354) -------------------------------------------------------
    rat AAT    (1282) TATTAAACTCAGGCTGGCCTGGCCT------------------------------
  sheep AAT    (1315) CATTAAAGGATAACTGACCT-----------------------------------
  Consensus    (1381) CATTAAA    GGCTG CCTGG
```

mouse alpha1-antitrypsin polypeptide sequence

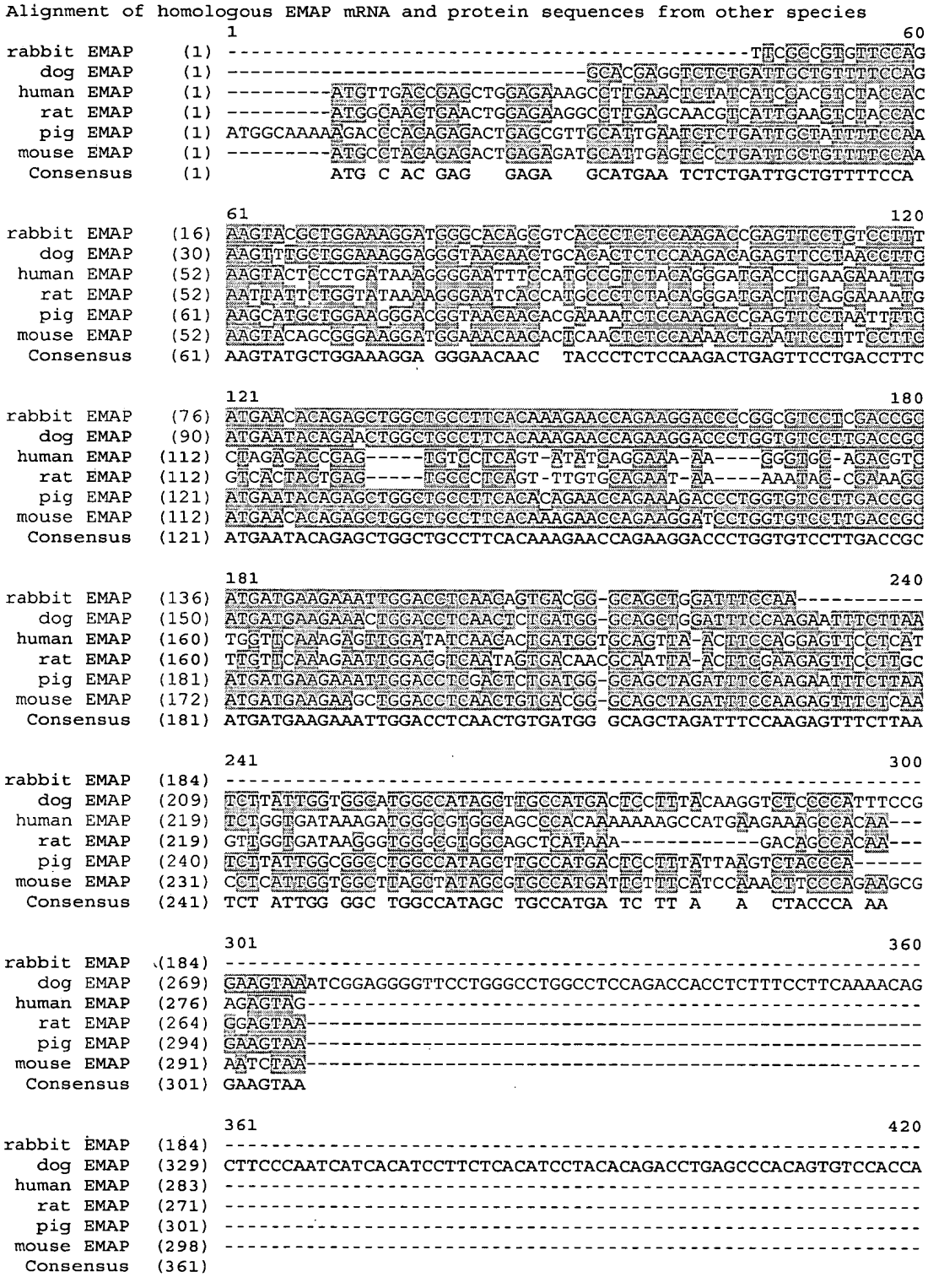
```
  1 MTPSISWGLL LLAGLCCLVP SFLAEDVQET DTSQKDQSPA SHEIATNLGD FAISLYRELV
 61 HQSNTSNIFF SPVSIATAFA MLSLGSKGDT HTQILEGLQF NLTQTSEADI HKSFQHLLQT
121 LNRPDSELQL STGNGLFVNN DLKLVEKFLE EAKNHYQAEV FSVNFAESEE AKKVINDFVE
181 KGTQGKIVEA VKELDQDTVF ALGNYILFKG KWKKPFDPEN TEEAEFHVDK STTVKVPMMT
241 LSGMLDVHHC STLSSWVLLM DYAGNASAVF LLPEDGKMQH LEQTLNKELI SKILLNRRRR
301 LVQIHIPRLS ISGEYNLKTL MSPLGITRIF NNGADLSGIT EENAPLKLSK AVHKAVLTID
361 ETGTEAAAAT VFEAVPMSMP PILRFDHPFL FIIFEEHTQS PIFVGKVVDP THK*
```

Alignment of homologous protein sequences from other species

```
                     1                                                           60
  mouse AAT     (1)  MTPSISWGLLLLAGLCCLVPSFLAEDVQ-----ETDTSQKDQS-PASHEIATNLGDFAIS
    rat AAT     (1)  -APSHGGSCFWQPCVAWPPASWLRMPRKP-IPPSRTRVQPTVRFLQTWQTLPSAYTGSWS
  human AAT     (1)  -MPSSVSWGILLLAGLCCLVPVSLAEDPQGDAAQKTDTSHHDQDHPTFNKITPNLAEFAFS
  sheep AAT     (1)  MALSITRGLLLLAALCCLAPTSLAGVLQGHAVQETDDTAHQEAA--CHKIAPNLANFAFS
hamster AAT     (1)  MKPSISWGILLLAGLCCLVPSFLAEDAQ-----ETDASKQDQEHQACCKIAPNLADFSFN
 rabbit AAT     (1)  MPPSVSRALLLLAGLGCLLPGFLADEAQ-----ETAVSSHEQDRPACHRIAPSLVEFALS
  Consensus     (1)  M PSIS GLLLLAGLCCLVPSFLAED Q     ETD S HDQD PACHKIAPNLADFAFS

                     61                                                         120
  mouse AAT    (55)  LYRELVHQSNTSNIFFSPVSIATAFAMLSLGSKGDTHTQILEGLQFNLTQTSEADIHKSF
    rat AAT    (59)  TNPIHPTSSSPL-ASPQPSPCSPWGARVTLANRF-RAWSSTSHRYLRLTSTRPSITSSKL
  human AAT    (60)  LYRQLAHQSNSTNIFFSPVSIATAFAMLSLGTKADTHDEILEGLNFNLTEIPEAQIHEGF
  sheep AAT    (59)  TYHKLAHQSNTSNIFFSPVSIASAFAMLSLGAKGNTHTEILEGLGFNLTELAEAEIHKGF
hamster AAT    (56)  LYRELVHQSNTTNIFFSPVSIATAFAMLSLGTKGVTHTQILEGLGFNLTEIAEAEVHKGF
 rabbit AAT    (56)  LYREVARESNTTNIFFSPVSIALAFAMLSLGAKGDTHTQVLEGLKFNLTETAEAQIHDGF
  Consensus    (61)  LYRELAHQSNTTNIFFSPVSIATAFAMLSLGTKGDTHTQILEGL FNLTETAEAEIHKGF

                     121                                                        180
  mouse AAT   (115)  QHLLQTLNRPDSELQLSTGNGLFVNNDLKLVEKFLEEAKNHYQAEVFSVNFAESEEAKKV
    rat AAT   (117)  STGQTVSCS-------TQAMASLSTRI-SWWRSFWKRSRTITTQKPSLSTLPTQKRLRK-
  human AAT   (120)  QELLRTLNQPDSQLQLTTGNGLFLSEGLKLVDKFLEDVKKLYHSEAFTVNFGDHEEAKKQ
  sheep AAT   (119)  QHLLHTLNQPNHQLQLTTGNGLFINESAKLVDTFLEDVKNLHHSKAFSINFRDAEEAKKK
hamster AAT   (116)  HNLLQTFNRPDNELQLTTGNGLFIHNNLKLVDKFLEEVKNDYHSEAFSVNFTDSEEAKKV
 rabbit AAT   (116)  RHLLHTVNRPDSELQLAAGNALVVSENLKLQHKFLEDAKNLYQSEAFLVDFRDPEQAKTK
  Consensus   (121)  QHLL TLNRPDSELQLTTGNGLFISE LKLVDKFLEDVKNLYHSEAFSVNF DSEEAKK
```

```
                    181                                                 240
  mouse AAT  (175) INDFVEKGTQGKIVEAVKELDQDTVFALGNYILFKGKWKKPFDPENTEEAEFHVDKSTTV
    rat AAT  (168) LMIM-RREPKERLI--NSWTKTRFLPW-ITFSLKASGRGHSILSTLGMLTLT-TSPPQ-
  human AAT  (180) INDYVEKGTQGKIVDLVKELDRDTVFALVNYIFFKGKWERPFEVKDTEDEFHVDQVTTV
  sheep AAT  (179) INDYVEKGSHGKIVDLVKDLDQDTVFALVNYISFKGKWEKPFEVEHTTERDFHVNEQTTV
hamster AAT  (176) INGFVEKGTQGKIVDLVKDLDKDTVFALVNYIFFKGKWKKPFDADNTEEADFHVDKTTTV
 rabbit AAT  (176) INSHVEKGTRGKIVDLVQELDARTLLALVNYVFFKGKWEKPFEPENTKEEDFHVDATTTV
  Consensus  (181) INDFVEKGTQGKIVDLVKELDKDTVLALVNYIFFKGKWEKPFEVENTEE DFHVD TTTV

                    241                                                 300
  mouse AAT  (235) KVP----MMTLSGMLDVHHCSTLSSWVLLMDYAGNASAVFLLPEDGKMQHLEQTLNKELI
    rat AAT  (221) RCP--TAWACLTCTIAAHCPAGC--WLTWATPLP-SSSCPMMARCSIWSKLSPRISFPGS
  human AAT  (240) KVP----MMKRLGMFNIQHCKKLSSWVLLMKYLGNATAIFFLPDEGKLQHLENELTHDII
  sheep AAT  (239) KVP----MMNRLGMFDIHHYCDKLASWVLLLDYVGNVTACFILPDLGKLQQLEDKLNNELI
hamster AAT  (236) KVP----MMSRLGMFDVHHYVSTLSSWVLLMDYLGNATAIFILPDDGKMQHLEQTLNKETI
 rabbit AAT  (236) RVP----MMSRLGMYVMFHCSTLASTVVLMDYKGNATALFLLPDEGKLQHLEHTLTTELI
  Consensus  (241) KVP    MMSRLGMFDVHHCSTLSSWVLLMDYLGNATAIFILPDDGKLQHLEQTLN ELI

                    301                                                 360
  mouse AAT  (291) SKILLNRRRRLVQIHIPRLSISGEYNLKTLMSPLGITRIFNNGADLSGITEENAPLKLSK
    rat AAT  (276) C-TGKQGQPFSTSPNCFSLEPIT-RHS-AHWASPGSSTMMLISLESQRMPP-----SLAR
  human AAT  (296) TKFLENEDRRSASIHLPKLSITGTYDLKSVLGQLGITKVFSNGADLSGVTEE-APLKLSK
  sheep AAT  (295) AKFLEKKYASSANIHLPKLSISETYDLKTVLGELGINRVFSNGADLSGITEE-QPLMVSK
hamster AAT  (292) GKFLKDRHTRSANVHFPKLSISGTYNLKTALDPLGITQVFSNGADLSGITED-VPLKLGK
 rabbit AAT  (292) AKFLAKSSFRSVTVRFPKLSISGTYDLKPLLGKLGITQVFSDNADLSGITEQ-EALKVSQ
  Consensus  (301) AKFL NR  RSASLHLPKLSISGTYDLKTLLG LGITRVFSNGADLSGITEE  PLKLSK

                    361                                                 420
  mouse AAT  (351) AVHKAVLTIDETGTEAAAAATVFEAVPMSMPPILRFDHPFLFIIFEEHTQS-PIFVGKVVD
    rat AAT  (328) LCIRLC-P-MRGEQRLQEPLWWRPSPCLCPLK-SSTTLSFS--LNQKLRAPSLWEK--IP
  human AAT  (355) AVHKAVLTIDEKGTEAAGAMFLEAIPMSIPPEVKFNKPFVFLMIEQNTKS-PLFMGKVVN
  sheep AAT  (354) ALHKAALTIDEKGTEAAGATFLEAIPMSLPPDVEFNRPFLCILYDRNTKS-PLFVGKVVN
hamster AAT  (351) AVHKAVLTIDERGTEAAGATFMEIIPMSVPPEVNFNSPFLAIIYDRQTAKSPLFVGKVVD
 rabbit AAT  (351) ALHKVVLTIDERGTEAAGATFVEYVLYSMPQRVTFDRPFLFVIYSHEVKS-PLFVGKVVD
  Consensus  (361) AVHKAVLTIDEKGTEAAGATFLEAIPMSMPPEV FNRPFLFIIYD NTKS PLFVGKVVD

                421
  mouse AAT  (410) PTHK-
    rat AAT  (381) HV---
  human AAT  (414) PTQK-
  sheep AAT  (413) PTQA-
hamster AAT  (411) PTR--
 rabbit AAT  (410) PTQH-
  Consensus  (421) PTQ
```

Fig 3D


Alignment of homologous EMAP mRNA and protein sequences from other species
rabbit EMAP
dog EMAP
human EMAP
rat EMAP
pig EMAP
mouse EMAP
Consensus

```
                    421                                     460
rabbit EMAP  (184) ----------------------------------------
   dog EMAP  (389) CCCTGTGCAGGCCAGTCCTGCTGGTAGTGAATAAAGCAAT
 human EMAP  (283) ----------------------------------------
   rat EMAP  (271) ----------------------------------------
   pig EMAP  (301) ----------------------------------------
 mouse EMAP  (298) ----------------------------------------
  Consensus  (421)
```

Mouse EMAP protein sequence

```
   1  MPTETERCIE SLIAVFQKYS GKDGNNTQLS KTEFLSFMNT ELAAFTKNQK DPGVLDRMMK
  61  KLDLNCDGQL DFQEFLNLIG GLAIACHDSF IQTSQKRI*
```

Alignment of homologous protein sequences from other species

```
                    1                                                   60
   dog EMAP     (1) -----------TRSLIAVFQKFAGKEGNNCTLSKTEFLTFMNTELAAFTKNQKDPGVLDR
 mouse EMAP     (1) ---MPTETERCTESLIAVFQKYSGKDGNNTQLSKTEFLSFMNTELAAFTKNQKDPGVLDR
rabbit EMAP     (1) ---------------FAVFQKYAGKDGHSVTLSKTEFLSFMNTELAAFTKNQKDPGVLDR
 human EMAP     (1) ---MLTELEKAINSTIDVYHKYSLIKGNFHAVYRDDLKKLLETECPQYIRKK----GADV
   rat EMAP     (1) ---MATELEKAISNVIEVYHNYSGIKGNHHALYRDDFRKMVTTECPQFVQNK----NTES
   pig EMAP     (1) MAKRPTETERCIESLIATFQKHAGRDGNNTKISKTEFLIFMNTELAAFTQNQKDPGVLDR
  Consensus     (1)    M TE EK I SLIAVFQKYAGKDGNN  LSKTEFLSFMNTELAAFTKNQKDPGVLDR

                    61                                  102
   dog EMAP    (50) MMKKLDLNSDGQLDFQEFLNLIGGMAIACHDSFTRSPHFRK-
 mouse EMAP    (58) MMKKLDLNCDGQLDFQEFLNLIGGLAIACHDSFIQTSQKRI-
rabbit EMAP    (46) MMKKLDLNSDGQLDFQ--------------------------
 human EMAP    (54) WFKELDINTDGAVNFQEFLILVIKMGVAAHKKSHEESHKE--
   rat EMAP    (54) LFKELDVNSDNAINFEEFLALVIRVGVAAHKDSHKE------
   pig EMAP    (61) MMKKLDLDSDGQLDFQEFLNLIGGLAIACHDSFIKSTQK---
  Consensus    (61) MMKKLDLNSDGQLDFQEFLNLIGGLAIACHDSF KSS K
```

Fig. 4